

# ESA-133 Public Report

## Introduction:

This Energy Savings Assessment refers to a portion of the GlaxoSmithKline Research and Development Center in Research Triangle Park, NC which is served by a central utility plant – Building 8. The steam system was analyzed and modeled using SSAT and five recommendations made to GSK management.

## Objective of ESA:

Identify improvement recommendations for the steam system and to train on-site personnel to correctly model the current system and to predict potential savings using the DOE Steam Tools Suite.

## Focus of Assessment:

Steam generation and primary distribution system serving eight research and development buildings – approximately 1,000,000 ft<sup>2</sup> of floor space

## Approach for ESA:

The assessment considered mechanical equipment and system configuration within the buildings, which are fed with steam and chilled water from Building 8 – the central plant. Steam is used almost exclusively for HVAC by means of steam to hot water for general space heating, steam to clean steam for humidification of laboratories, and steam to water for domestic hot water. The site lead provided a list of potential projects already under consideration by GSK. These projects and an additional opportunity identified as a result of the initial walk-through were considered. The Expert and Site Lead created an SSAT base model and modeled each measure. Results were presented to management.

## General Observations of Potential Opportunities:

- Indicate total plant natural gas cost for base year 2005      \$3.1 million for 279,503 MMBTU of natural gas.
- Indicate impact fuel cost in \$/MMBtu, impact electrical cost in cents/kWh if necessary for ESA. Price for gas with current contract: \$11.37/MMBTU burner-tip, average electrical costs are about \$0.0485/kWh.
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- Note what you would expect would be Near Term, Medium Term, Long Term opportunities. See definitions below:
  - ❑ Near term opportunities would include actions that could be taken as improvements in operating practices, maintenance of equipment or relatively low cost actions or equipment purchases.

**Implement Steam Trap Maintenance Program - Formalize steam trap maintenance.** This opportunity establishes a formal schedule for testing steam traps. Recent efforts have resulted in significant reductions in trap failures and other problems. This recommendation encourages the regular testing of traps to maintain the savings.

- ❑ Medium term opportunities would require purchase of additional equipment and/or changes in the system such as addition of recuperative air preheaters and use of energy to substitute current practices of steam use etc. It would be necessary to carryout further engineering and return on investment analysis.

**Change Boiler Efficiency - Install Boiler Economizers.** This is a project that is currently under consideration. SSAT was able to confirm the predicted savings and encourage management to move forward with the project.

**Modify Feedwater Heat Recovery Exchanger Using Boiler Blowdown - Recover Heat from CSG Blowdown.** A significant flow of blowdown was noted during the walk-through. Recover heat from this hot stream and preheat make-up water to the clean steam generator.

**Modify Feedwater Heat Recovery Exchanger Using Condensate Tank Vent - Recover Heat from Condensate Flash Vent.** Install a heat exchanger in the condensate flash vent for Building 1 to preheat either clean steam generator make-up water or domestic hot water.

**Improve Insulation - Insulate Hot Surfaces.** Insulate the few remaining bare hot surfaces, including pressure reducing valves, pressure powered condensate pumps, clean steam generator ends, and a few short lengths of piping. Much of this is already in progress and should be completed in the next several months.

- ❑ Long term opportunities would require testing of new technology and confirmation of performance of these technologies under the plant operating conditions with economic justification to meet the corporate investment criteria.

- Estimate, if possible, % plant natural gas savings from
  - a) Near Term opportunities - approximately 2.5% of natural gas purchases
  - b) Medium Term opportunities - approximately 4.5% of natural gas purchases
  - c) Long Term opportunities. - None identified

### **Management Support and Comments:**

The utilities at this facility are all managed by Johnson Controls, who operates them on behalf of GSK. Upper management support is good, especially in light of recent energy cost increases. There is now a definite focus on energy projects. Johnson Controls provides an extensive level of experience and superior service when compared to other manufacturing plants that I've assessed that do the work in-house. This assessment mostly confirms that Johnson Controls is doing a good job of identifying, categorizing, and implementing energy saving projects.

### **DOE Contact at Plant/Company:**

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